

On Practical Teaching of College Mathematics

Xiaobo Liu

School of Information Engineering, Nanjing Xiaozhuang University, Nanjing, China

Keywords: practical teaching, college mathematics

Abstract: The teaching of mathematics knowledge in colleges and universities is an important link in engineering education. The development of other subjects is closely related to mathematics education. Students have a great interest in the college mathematics practice course, it changes the mathematics teaching mode to the practice mode. Carrying out the university mathematics practice course would improve the confidence of running mathematics practice course, enable students to fully grasp mathematics knowledge, and achieve a good learning goal.

1. Introduction

As an important basic subject in colleges and universities and an accurate scientific language used by all disciplines, university mathematics plays an important role in the study of subsequent courses and the cultivation of thinking quality. At the same time, the fundamental status of mathematics decides that it plays an increasingly important role in the fields of natural and social science and engineering technology.

In the past teaching activities. Most teachers still adopt the teaching mode of indoctrination method focusing on imparting knowledge. Resulting in the situation of emphasizing theory and indoctrination, and neglecting practice and enlightenment in teaching. mathematical problems were from practice, so students need starting from the actual problem, through students personally design and hands-on to experience the problem solving process, to learn, explore and discover mathematical laws from the experiments. Practical teaching of college mathematics aims at cultivating students' engineering thinking ability and innovation ability.

2. Principles of practical teaching of college mathematics

2.1 Normative principle

Carrying out practical teaching activities in university mathematics must follow the normative principle. The normative principle means that in teaching activities, we must follow certain standard requirements, formulate corresponding assessment and evaluation system, and strictly follow the normative principle, to truly implement the requirements of practical teaching activities.

2.2 Theory guiding practice principle

Theoretical knowledge is always the basis for guiding practical teaching. The emphasis on carrying out practical teaching activities is not to ignore theoretical knowledge, but to pay more attention to study theoretical knowledge. Only with a solid theoretical foundation, it could be flexibly applied in practical teaching activities. Educating students learn theoretical knowledge well and actively guiding them to fully apply what they have learned in practical activities are the requirements of practical teaching.

2.3 Increasing practice education principle

With a good theoretical basis, students are encouraged and guided to actively participate in more mathematics competitions and extracurricular interest groups, which not only allows students to fully test and strengthen theoretical knowledge in practice, but also provides a good guarantee for better practical teaching activities. Moreover, a good competition and competition atmosphere can improve students' psychological quality and innovation ability, and lay a good foundation for their

future study and work.

3. Features of practical teaching of college mathematics

University mathematics mode of practical teaching is one of the traditional teaching mode of university innovation and reform, the teaching method is no longer just starting from the concept, but lets the student from accepting the theoretical knowledge passively to explore and discover and solve problems and discover the process of theory and conclusion with fully subjective initiative.

3.1 Situationality

The situationality of practical teaching, on the one hand, refers to on-the-spot teaching, including learners' practice in actual work positions and participation in real professional roles. On the other hand, it refers to classroom teaching. According to the requirements of practical teaching, teachers select and create problems close to the reality. Through practical examples and auxiliary conditions, they can present the difficult knowledge in mathematics more intuitively to students.

3.2 Full course

Practical teaching is not only an effective teaching activity, but also represents an education teaching concept throughout the whole teaching process. From a horizontal perspective, it indicates that all elements of teaching should be integrated and reorganized to achieve the overall optimization in the process of practical teaching. From the vertical perspective, it means that the training of practical teaching should be progressive, circular and spiral with the advancement of professional teaching process and the continuous development of various training.

3.3 Integrity

This is mainly reflected in two aspects. First, practical teaching itself is composed of a series of elements, including teaching objectives, teaching contents, teaching forms, teaching management and teaching guarantee. Secondly, the practice teaching cultivates people comprehensively and completely, it is importance to students' professional ability, method ability and social ability development, also want to give them occupational strain capacity facing the new situation and new problems, and actively encourage students debug their ideas, behavior patterns according to the change of the outside world, pay attention to the formation of students' professional quality including quality awareness, safety consciousness, innovative consciousness and so on, but also cultivates the students' professional emotion, will, and ethics and the ability of communication and collaboration with people.

3.4 Openness

Openness of practice teaching performs in the teaching content of openness, which means that it must focus on industry and the social demand, absorb the latest technical achievements from industry and enterprise timely and use it as the basis of vocational ability development. Openness of the teaching form performs in learners' participatory learning is not only confined to the classroom, but also actively carry out personnel training mode of work-integrated learning. Teachers also have openness, teachers should not only study in business, but also recruit expert part-time teachers from the society, forming teaching staff with full-time teachers and part-time teachers. From the teaching evaluation, the evaluation of enterprises and society should be incorporated into the reference system of evaluation.

3.5 Associativity

The combination of work and study is not only a significant feature of education practical teaching in higher vocational colleges, but also an important mode of higher vocational personnel training. It realizes the organic combination of in-class and out-of-class, on-campus and off-campus practice teaching, and promotes the integration of theoretical knowledge and practical knowledge, work and study. It is an effective way to build a practical teaching system through the cooperation

mechanism of school-enterprise win-win.

To carry out practical teaching in college mathematics is to cultivate students' ability to establish mathematical models, analyze and deal with practical problems with relevant data. All of these require students to have the insight, understanding and Abstract ability of practical problems, the ability to build mathematical models, the ability to design algorithms, program, computer calculation of the established mathematical models, and the ability to analyze and deal with the calculation results, so as to solve practical problems effectively.

3.6 Subjectivity

Subjectivity is to make students masters of study and class. In the previous classroom teaching, teachers taught, and students were only passively listening and learning. The characteristics of practical teaching required students to be the subject of the class to give full play to their initiative. Students can put forward their own views and opinions in the study of knowledge, find problems and try their best to solve them. In this way, students can not only cultivate their divergent and creative thinking, but also promote the integration and promotion of mathematics and other subjects to a large extent through more practical operations.

4. Course structure design of university mathematics practice course

Cultivating technical and applied talents is the key of practical teaching and the characteristic of education in university mathematics. Therefore, it is necessary to attach importance to practical teaching, strengthen the cultivation of students' innovation ability and practical ability, and change the traditional experimental teaching mode based on theoretical verification to the new practical teaching mode based on skill training. It is necessary to take the professional teaching reform as the center, take the practice of education as the focus of the reform, and explore the practical teaching mode construction of applied talents.

First, it is necessary to construct a targeted practical teaching mode, including experiment, practical training and practical training content, so as to form an organic, mutually integrated, interlaced and permeated whole. And according to the theoretical teaching and experimental verification, it should design innovation ability practice, skills training practice and so on. Secondly, college mathematics should attach importance to practical teaching.

At present, the concept of higher education in China is changing. In addition to focusing on the cultivation of social applicable talents, it is also necessary to cultivate high-quality engineering and technology talents who are capable of operation, management, innovation and operation. Therefore, we should try to apply multi-module and multi-level new teaching mode in practical teaching of college mathematics. The practical teaching mode of university mathematics emphasizes two modules: theoretical application and practical ability training in the course structure design.

4.1 Theoretical application module

The needs of each major for mathematical knowledge can be satisfied to the maximum extent according to the setting of theoretical application module in the course teaching content. The theoretical application module is one of the most important links in mathematics practical teaching. Educators need to explain in detail so that students can thoroughly understand and master, and start from the need and application of solving practical problems, the practical needs of the society and the needs of follow-up courses of the discipline, pay attention to the teaching system and content of basic ability, so as to build the basic knowledge in engineering.

4.2. Ability cultivation module

It is necessary to update the reform of mathematics system and teaching contents from the perspective of students' engineering implementation, engineering design, engineering knowledge, social function adjustment, value judgment and lifelong learning. Paying attention to students' practical value, making students have more real and intuitive feelings about the boring mathematical principles and theories in class, so as to better grasp and understand the content of

practical lessons. New feeling and new vision will make students have enthusiasm and interest in the study and application of mathematics knowledge.

Practical teaching of college mathematics not only imparts some practical mathematics tools to students, but also trains students' mathematics quality, thinking, application and innovation ability. To some extent, the cultivation of talent quality in colleges depends on the cultivation and quality of mathematics, which should be fully reflected in the teaching of mathematics practical courses. Therefore, it is necessary to teach students to apply basic mathematical thoughts and master common mathematical tools in the most basic training of mathematics. In addition to meeting the needs of mathematics learning in subsequent courses, it is also necessary to teach students to apply mathematical knowledge to analyze and summarize problems.

5. Content design of practical courses in university mathematics

At present, the content of the course of mathematical experiment is mainly selected from probability statistics, linear algebra and higher mathematics. After the linear, simplified and shallow processing of practical problems, it is finally summarized in a relatively simple form. In terms of breadth and depth, its content is generally between mathematical modeling and mathematics courses. In the application of mathematics, it is a transitional part, which can be analyzed from different levels.

First, the teaching of calculus in mathematics teaching content keep the original recitation, classroom teaching, and regular homework, add computer teaching experiment combining with the reality, namely going to do a bunch of operations including integral, derivative and limit by using mathematical software on computer, study the change rule of function deeper, verify the theorem, draw the curved surface and curve graph, explore the new law and so on. Based on applying computer to carry out mathematics experiment, the students' ability to use computer to perform calculus calculation is trained, which provides conditions for students to use computer to calculate and deal with mathematics problems in future work and study.

Second, by combining with the computer mathematics software package, students can comprehensively master the basic theory, method and concept of the calculation method, so that students can have the ability to program and design algorithms, deal with the convergence of algorithms and estimate the error. The reason for this is that the mathematics software package is constantly evolving in the context of computer contents, and it is not completely inclusive to all algorithms, and it is also a category of programming language. To have a better understanding of the usage and function of the math software package, you need to master the basic theory and concept of the calculation method. Therefore, teachers can master the math software package very well, which is of great significance to calculate and deal with various mathematical problems. At the same time, teachers also need to be capable of designing algorithms and programming.

Third, the application of mathematical software package, processing of practical numerical methods, mathematical modeling and data processing should be taught according to the purpose of cultivating students' innovative ability and thinking ability, which provides conditions for practice.

6. Conclusion

Mathematics practice course is a challenge to the traditional mathematics education mode, the basic point is to change our concept of mathematics education, the teaching method from the practical problems, do not pursue course of systematic and integrity, and pay attention to the process of dealing with problems and sums up the rule, it is conducive to play to students' learning and independent thinking and problem solving ability of exercise.

References

[1] Shang Chunhong, Exploration and practice of mathematics experimental teaching, Journal of Mathematics Education, pp. 66-68, vol. 3, 2002.

[2] Engineering education visiting mission of State Education Commission to the United States, Return to engineering and education reform of American higher engineering, China Higher Education, vol.3, 1996.